

**ABSTRACT****ASSAYS, AGENTS, THERAPY AND DIAGNOSIS RELATING TO  
MODULATION OF CELLULAR DNA REPAIR ACTIVITY**

A yeast homologue of mammalian DNA ligase IV is provided and a role for DNA ligase IV established in the Ku-associated DNA repair pathway. Additionally interactions between DNA ligase IV and XRCC4, and interaction between XRCC4 and DNA-PKcs/Ku are established, providing for assays for agents which modulate such interactions and therefore cellular DNA repair activity. Such agents are useful in treatment of cancers, retroviral infections, immune system disorders and other conditions in which cellular DNA repair activity plays a role. Individuals with a predisposition to a disorder in which DNA repair plays a role may be diagnosed, by screening for the presence or absence of a defect in XRCC4 and/or DNA ligase IV activity.